

L 24270-66

ACC NR: AP6007022

fore, unlike in the optical method, the acceptor does not become excited even if it absorbs strongly in the same region as the donor. It is planned to investigate the correlation between the energy transfer rate and the nature of the electronic states of the donor and acceptor. .

SUB CODE: 20/ SUBM DATE: 21Jun65/ ORIG REF: 003/ OTH REF: 003

Card 2/2 *dda*

L 37206-66 EWT(m)/BNP(j) RM

ACC NR: AP6014416

SOURCE CODE: UR/0062/66/000/004/0773/0773

AUTHOR: Vasil'yev, R. F.; Nalbandyan, D. M.

ORG: Institute of Chemical Physics Academy of Sciences SSSR and
Institute of Agriculture ArmSSR (Institut khimicheskoy fiziki Akademii
nauk SSSR i Institut zemledeliya ArmSSR)

TITLE: New chemiluminescent reaction: interaction of 1
dicyclohexylperoxydicarbonate and N,N-dimethylaniline

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 4, 1966, 773

TOPIC TAGS: chemiluminescence, chemical reaction, organic nitrogen
compound, secondary amine, peroxy organic acid

ABSTRACT: The reaction of dimethylaniline and dicyclohexylperoxydicarbonate
in benzene at 20° is accompanied by chemiluminescence in the visible
range of the spectrum, and is visible to the eye if reagent concentra-
tions are 0.2 M/l and the reaction is run in the presence of oxygen.
The reaction will go in the absence of oxygen; the luminescence is then
less intense and is maximum at the instant of reagent mixing and
decreases according to $I = I_0 e^{-\alpha t}$ within a certain range of reagent
concentrations. This led to the conclusion that the reaction goes

Card 1/2

UDC: 543.422 661.729 547.333

L 37206-66

ACC NR: AP6014416

through an intermediate complex before the formation of N-cyclohexyloxy methyl-N-methylaniline. Orig. art. has: 1 equation.

SUB CODE: 07/ SUBM DATE: 11Feb66/ ORIG REF: 001

Card 2/2 MCLP

PAPISOVA, V.I.; SHLYAPINTOKH, V.Ya.; VASIL'YEV, R.F.

Chemiluminescence and kinetics of chemical reactions. Usp.
khim. 34 no.8:1416-1447 Ag '65. (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova
i Institut khimicheskoy fiziki AN SSSR.

EMANUEL', Nikolay Markovich; DENISOV, Yevgeniy Timofeyevich;
MAYZUS, Zinaida Kushel'svna. Prinsipial'no uchastie:
ANTONOVSKIY, V.L.; BLYUMBERG, E.A.; VASIL'YEV, R.F.;
GAGARINA, A.B.; GOL'DBERG, V.M.; ZAIKOV, G.Ye.; DORIKOV,
Yu.D.; OBUKHOVA, L.K.; TSEPALOV, V.F.; SHLYAPINTOKH,
V.Ya.; SKIBIDA, I.P., red.

[Oxidation chain reactions of hydrocarbons in the liquid
phase] Tsepnye reaktsii okisleniya uglevodorodov v
zhidkoi faze. Moskva, Nauka, 1965. 374 p. (MIRA 18:8)

ALLABUTAYEV, K.A.; VASIL'YEV, R.F.; VICHUTINSKIY, A.A.; RUSINA, I.F.

Mechanism of chemiluminescence of oxidation reactions in
solutions. Trudy MOIP. Otd. biol. 21:8-18 '65. (MIRA 18:6)

EMANUEL', N.M.; KRUGLYAKOVA, E.Ye.; ZHIZHINA, G.P.; VICHUTINSKIY, A.A.;
VASIL'YEV, R.F.

Chemiluminescence of DNA solutions following X-ray irradiation.
Trudy MOIP. Otd. biol. 21:119-121 '65. (MIRA 18:6)

VASIL'YEV, R.F.

Photoelectric devices for studying weak luminescences. Izv.
MOIP. Otd. biol. 21:170-176 '65. (MIRA 18:6)

VASIL'YEV, R.F.

Some problems of the mechanism of chemiluminescence. Trudy
MOIP. Otd. biol. 21:198-202 '65. (MIRA 18:6)

ACCESSION NR: AP5020794

UR/0048/65/029/008/1331/1334

AUTHOR: Vasil'yev, R. F.

TITLE: Chemiluminescence in solutions /Report, 13th Conference on Luminescence

1. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

2. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

3. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

4. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

5. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

6. The results of the investigation of the chemiluminescence of the luminophore in the presence of various substances are presented.

1. *Introduction*

ACCESSION Nr: AP5020794

in ethylbenzene and acetic acid. It is concluded that chemiluminescence will find applications in the study of the kinetics of the reaction of organic peroxides with organic compounds.

$$k \geq \sum_{i=1}^n |J_i| \cdot p_i^{\max} \quad \text{and} \quad \alpha_i = \frac{1}{p_i^{\max}} \quad \text{for } i = 1, \dots, n, \quad \text{and} \quad \alpha_{n+1} = \frac{1}{A} \cdot \frac{1}{\sum_{i=1}^n |J_i| \cdot p_i^{\max}}.$$

100

L 01482-66 EWT(1)/EWT(m)/EPF(c)/EWG(m)/EWP(j)/T/EWA(c)/ETC(m) IJP(c)
 DS/EA/AM/JN/WE/RM
 ACCESSION NR: AP5021782

UR/0074/65/034/008/1416/1447
 535.37:531.1

AUTHOR: Papisova, V. I. Shlyapintokh. V. Ya.; Vasil'yev, R. F.

TITLE: Chemiluminescence and kinetics of chemical reactions

SOURCE: Uspekhi khimii, v. 34, no. 8, 1965, 1416-1447

TOPIC TAGS: chemiluminescence, chemical kinetics

ABSTRACT: The review is devoted to the relationship between chemiluminescence and reaction kinetics, and is based on studies in which chemiluminescence was investigated in reactions whose mechanism was reliably determined, or in which the reactions were investigated both by means of luminescence and by methods of chemical kinetics. Particular attention is given to the potential of chemiluminescence as a method of quantitative study of reaction kinetics. The article is divided into the following sections: (1) chemiluminescence of flames; (2) reactions of nitrogen, oxygen, and hydrogen atoms; (3) infrared chemiluminescence in thermal reactions; (4) liquid-phase oxidation reactions associated with bright chemiluminescence; (5) systems with faint chemiluminescence. The first three sections deal with gas-phase

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ACCESSION NR: AP5021782

7
reactions (hot and cold flames, reactions of atoms obtained in high concentration in electrical discharges). The fourth section discusses liquid-phase reactions such as oxidation of cyclohydrazides and acridine compounds. In the fifth section, the reactions considered do not differ fundamentally from the others, but include a great many that are of interest from the theoretical and practical points of view. Orig. art. has: 9 figures, 1 table, and 30 formulas.

ASSOCIATION: MGU im. M. V. Lomonosova i In-t khimicheskoy fiziki AN SSSR (Moscow State University and Institute of Chemical Physics, AN SSSR)

SUBMITTED: 00 9455

ENCL: 00

SUB CODE: - GC

NO REF SOV: 066

OTHER: 123

Card 2/2

VASIL'YEV, R.F.

Chemiluminescence in solutions. Part 2. Opt. i spektr. 18
no.3:415-421 Mr '65. (MIRA 18:5)

L 26655-65 EWT(m)/EPF(c)/TWA(1)/EWP(1)/EWP(1) Pr-4 RM/JD/WB/GS

ACCESSION NR: AT5002263

S/0000/64/000/000/0146/0149

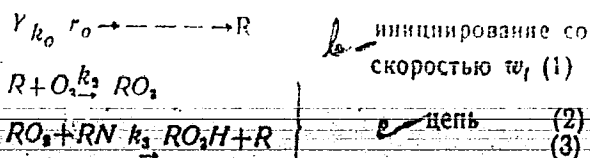
AUTHOR: Vasil'yev, R. F.; Vichutinskiy, A. A.

TITLE: Kinetics of chemiluminescence as a method for the quantitative investigation of liquid-phase oxidation reactions

SOURCE: Soveshchaniye po fizicheskim metodam issledovaniya stroyeniya molekul organicheskikh soyedineniy i khimicheskikh protsessov. Frunze, 1962. Trudy. Frunze, Izd-vo Ilim, 1964, 146-149

TOPIC TAGS: chemiluminescence kinetics, liquid phase oxidation, oxidation kinetics, hydrocarbon oxidation

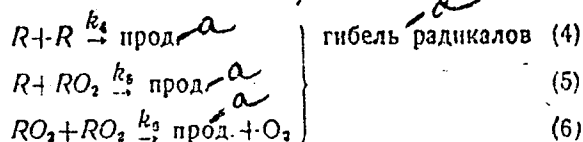
ABSTRACT: The purpose of this investigation was to determine the nature of the intensification of the chemiluminescence accompanying radical reactions in the presence of oxygen. Essentially, the following reactions were studied:



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L 26655-65

ACCESSION NR: AT5002263



Several new methods were suggested and tested in this paper for the quantitative study of oxidation reactions. These methods are based on the principle of competition (recombination of R radicals and formation of RO_2 radicals) and were explained using oxidation as an example. These methods were then used to find $k_3/\sqrt{k_6}$, $[O_2]_0$, $[O_2]_g$, k_0 , f , W_{O_2} , and w_i . The experimental data agree closely with that in the literature because measurements were not of the intensity, but of the time from the start of the reaction to the end of luminescence. Another approach is based on measurements in the range of decreasing luminescence. Theoretical curves were constructed from which the above magnitudes could again be determined. The systematic error in the calculated values was only 1-2%. Orig. art. has: 1 table and 7 formulas.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Chemical physics institute, AN SSSR)

SUBMITTED: 19Jun64

ENCL: 00

SUB CODE: 00

Card 2/2 NO REF SOV: 003

OTHER: 001

Card 1/2

L 34877-65

ACCESSION NR: AP5005036

of a high-aperture spectrometer. The duration of the excited state was determined from the extinction produced by extraneous substances (for example, oxygen). The spectrum was recorded either with the high-aperture spectrometer or with a set of optical filters. The quantum yield of the radiation of the product was estimated by using the laws governing the energy transfer to luminous especially introduced into the solution. The identification of the emitter will be treated in a sub-

ASSOCIATION: None

SUBMITTED: 16Feb64

ENCL: 00

SUB CODE: CP, OC

Card 2/2

ACCESSION NR: AP4045805

5/0062/64/000/009/1728/1728

AUTHOR: Vasil'yev, R. F.; Rusina, I. F.

TITLE: Chemiluminescence of molecular oxygen in the process of oxidation of organic compounds

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 9, 1964, 1728

TOPIC TAGS: chemiluminescence, hydrocarbon oxidation, ketone oxidation, oxygen chemiluminescence, free radical recombination

ABSTRACT: A predicted red chemiluminescence was observed on oxidation of methylethylketone, cyclohexane, and ethylbenzene in benzene solution. The dependence of the fraction of red luminescence on the composition indicates the different natures of the blue-green and red fractions. The red chemiluminescence is believed to be emitted from excited O_2 molecules.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

Card

1/2

L 15157-15

ACCESSION NR: AP4045805

SUBMITTED: 17May64

ENCL: 00

SUB CODE: GC

NO REF SOV: 002

OTHER: 002

Card 2/2

VASIL'YEV, R.F.

Chemical luminescence. Priroda 53 no. 12:22-30 '64.
(MIRA 18:1)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.

VASIL'YEV, R.F.; RUSINA, I.F.

Mechanism of chemiluminescence during the oxidation of
organic matter in solution. Dokl. AN SSSR 156 no.6:1402-
1405 Je '64. (MIRA 17:8)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno
akademikom N.N. Semenovym.

ACCESSION NR: AP4006495

S/0020/63/153/005/1101/1104

AUTHORS: Vasil'yev, R. F.; Rusina, I. F.

TITLE: Oxygen quenching of excited states in chemiluminescent solutions

SOURCE: AN SSSR. Doklady*, v. 153, no. 5, 1963, 1101-1104

TOPIC TAGS: chemiluminescence, hydrocarbon, benzene. ethyl-, liquid phase oxidation, hydrocarbon oxidation, chemiluminescence quenching, oxygen quencher, peroxydicarbonic acid. dicyclohexyl ester, anthracene. 9.10-dibromo-, chemiluminescence activator, intermolecular energy transfer, excited state, lifetime, quantum yield, luminescence yield, triplet singlet transition, luminophor, propionitrile. 2.2'-azobis [2-methyl-]

ABSTRACT: A study was made on the inherent tendency of oxygen to quench luminescence of a chemical system. An oxidation reaction of ethyl benzene in benzene (inert solvent) initiated by the decomposition of peroxydicarbonic and acid dicyclohexyl ester at 40°C was used for the study. The measurement of the relationship between the

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ACCESSION NR: AP4006495

chemiluminescence intensity and the O_2 concentration was facilitated by the fact that the oxidation of O_2 oxygen saturated mixture in a hermetically sealed vessel reduces the O_2 gradually. Shown in Fig. 1a (see enclosure) are two kinetic intensity curves of chemiluminescence corresponding to two different reaction rates for different concentrations of peroxydicarbonic and acid-dicyclohexyl ester. As the O_2 concentration is reduced, its quenching effect is weakened and its intensity increased. Curves I and II are replotted within the coordinates of the Stern-Volmer equation: $\frac{I_0}{I} = 1 + K\tau P [O_2]$ where I_0 and I are the intensities (photocurrents) of the quenched and unquenched luminescence, τP is the duration of the excited state of P, and k is the constant of the process rate: $P + O_2 \xrightarrow{k} KP + O_2$ were replotted as shown in

Fig. 1b of enclosures. The chemiluminescence in the oxidation of ethyl benzene represents a radiating T-S-transition in the acetophenone molecule, which is formed by a recombination of acidified ethyl-benzene radicals along with 2-phenyl-ethanol and O_2 . Quenching

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ACCESSION NR: AP4006495

is one of the reasons for the low intensity of the luminescence in liquid phase oxidation, and the main reason for the short duration of the excited state. Orig. art. has: 4 Figures and 5 Formulas.

ASSOCIATION: Institut khimicheskoy fiziki Akademii Nauk SSSR
(Institute of chemical physics, Academy of Sciences, AN SSSR)

SUBMITTED: 07Jun63

DATE ACQ: 09Jan64

ENCL: 01

SUB CODE: CH

NR REF SOV: 012

OTHER: 005

Card

3/43

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.; KARPUKHIN, O.N.; SHLYAPINTOKH, V.Ya.

Chemiluminescence in slow chemical reactions. Part 2: Effect of the chemical composition of the system on chemiluminescence intensity. Kin. i kat. 4 no.3:382-387 My-Je '63.
(MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Luminescence) (Chemical reaction, Rate of)

VASIL'YEV, R.F.; RUSINA, I.F.

Oxygen quenching of excited states in chemiluminescent
solutions. Dokl. AN SSSR 153 no.5:1101-1104 D '63.
(MIRA 17:1)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno
akademikom V.N. Kondrat'yevym.

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.

Chemiluminescence in reactions of liquid-phase oxidation. Izv.
AN SSSR. Ser. fiz. 27 no.6:729-734 Je '63. (MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Luminescence) (Chemical reactions)

EMANUEL', N.M.; KRUGLYAKOVA, K.Ye.; VICHUTINSKIY, A.A.; VASIL'YEV, R.F.

Chemiluminescence of deoxyribonucleic acid (DNA) solutions following irradiation by X rays. Izv. AN SSSR. Otd.khim.nauk no.6:1143 Je '63. (MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Nucleic acids) (X rays) (Luminescence)

VASIL'YEV, R.F.; KARPUKHIN, O.N.; SHLYAPINTOKH, V.Ya.

Setup for measuring weak luminous fluxes. Zhur. fiz. khim. 35
no.2:461-462 F '61. (MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.
(Photometry) (luminescence)

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.; CHERKASOV, A.S.

Chemiluminescence activated by anthracene derivatives. Dokl.
AN SSSR 149 no.1:124-127 Mr '63. (MIRA 16:2)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno
akademikom V.N.Kondrat'yevym,
(Luminescence) (Anthracene)

SHUVALOV, V.F.; VASIL'YEV, R.F.; POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.

Formation of excited formaldehyde molecules by low temperature
oxidation of acetaldehyde. Dokl. AN SSSR 148 no.2:388-390 Ja '63.
(MIRA 16:2)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom
V.N. Kondrat'yevym.
(Formaldehyde) (Acetaldehyde) (Oxidation)

S/020/63/149/001/016/023
B101/B144

AUTHORS: Vasil'yev, R. F., Vichutinskiy, A. A., Cherkasov, A. S.

TITLE: Chemiluminescence activated by anthracene derivatives

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 1, 1963, 124-127

TEXT: Luminescence spectra were used for studying how the oxidation of cyclohexane dissolved in benzene, or that of ethyl benzene by anthracene or its derivatives, is activated after having been initiated with α, α' -bis-isobutyric nitrile. The chemiluminescence spectrum of the oxidizing cyclohexane shows a slightly marked 430 - 450 m μ band. Addition of the activator changes the spectrum so as to make it identical with the fluorescence spectrum. Thus the reaction energy is transferred to the activator which is put into the excited singlet state. The effect of the anthracene derivatives is identical in the oxidation of cyclohexane and ethyl benzene. Bromo anthracene, dibromo anthracene, bromo-phenyl anthracene, dichloro anthracene and diphenyl anthracene are good activators. Anthracene, di-n-propyl anthracene and dimethyl anthracene are bad activators. The following ratios k_{PA}/f_p (1/mole) are given, where k_{PA} is

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S/020/63/149/001/016/023
B101/B144

Chemiluminescence activated by ...

the probability of energy transfer and f_p is the probability of emission: dibromo anthracene $6 \cdot 10^6$, bromo-phenyl anthracene $2 \cdot 10^6$, dichloro anthracene $2 \cdot 10^5$, bromo anthracene $2 \cdot 10^6$, and diphenyl anthracene $1 \cdot 10^4$. The intensification factor, κ , is described by: $(\kappa - 1)^{-1} = b + c[A]^{-1}$, where $[A]$ is the concentration of the activator. The low yield of chemiluminescence is connected with the low yield of excited product, but it is mainly due to the low effectiveness of excitation. From the fact that the activity of the anthracene derivatives increases with increasing content of halogen atoms and with the atomic number of the halogen, a triplet-singlet transfer is assumed. There are 4 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: October 1, 1962, by V. N. Kondrat'yev, Academician

SUBMITTED: September 24, 1962

Card 2/2

L 9866-63

EPR/EWP(j)/EPF(c)/EWT(l)/EWT(m)/BDS---AFFTC/ASD---Ps-l/Pe-l/Pr-l---

RM/WW/MAY/JFW/IJP(G)

ACCESSION NR: AP3001340

S/0048/63/027/006/0729/0734

AUTHOR: Vasil'yev, R. F.; Vichutinskiy, A. A.

TITLE: Investigation of chemiluminescence incident to oxidation reactions in the liquid phase [Report of the Eleventh Conference on Luminescence held in Minsk from 10-15 September 1962]

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v. 27, no. 6, 1963, 729-734

TOPIC TAGS: chemiluminescence, oxidation reactions, organic luminophors

ABSTRACT: Chemiluminescence²¹ defined as emission of radiation accompanying chemical reactions, was formerly thought to be a rare phenomenon peculiar to very fast reactions (flames) and exceptional exothermic liquid-phase reactions. Studies carried out since 1958 at the Institute of Chemical Physics, Academy of Sciences SSSR, have shown, however, that chemiluminescence is far more common than was assumed and occurs incident to many reactions, including industrially important ones like polycondensation (production of nylon), decomposition of peroxides and oxidation of hydrocarbons. Accordingly, research has been

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L 9866-63
ACCESSION NR:

ACCESSION NR: AP3001348

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continued at the Institute, aimed at elucidating the mechanism, characteristics and potentialities of chemiluminescence. The present experiments were concerned mainly with hydrocarbon oxidation reactions in the liquid phase, which are chain radical reactions; the accompanying luminescence is excited incident to recombination of the "oxidized" radicals. The chemiluminescence spectra were observed by means of a highly sensitive set-up, incorporating a grating monochromator and a selected and cooled photomultiplier. In addition to primary chemiluminescence, secondary effects were investigated. It was found that the chemiluminescence accompanying oxidation of methylethylketone is quenched by excess oxygen and by phenol (an oxidation inhibitor); chemiluminescence is stimulated by the introduction into the solution of various luminescent substances: anthracene, derivatives of oxazole, pyrazole, chlorophyll and anthraquinone. The stimulation is due to energy transfer rather than acceleration of the reaction rate. In general, however, there is observed direct correlation between the chemiluminescence intensity and the reaction rate. It is suggested that chemiluminescence may be a useful means for investigating the luminescence properties of molecules, for the excitation occurs uniformly over the entire volume, involves small amounts of energy and is not subject to intercombinational forbiddenness. Orig. art. has: 6 figures.

Card 2/3

L 9866-63

ACCESSION NR: AP3001348

0

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 00

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: PH,CH

NR REF SOV: 011

OTHER: 005

ja/nh
Card 3/3

L 12717-63 EWP(j)/EPF(c)/ENT(1)/ENT(m)/RDS AFFTC/ASD Pc-4/Pr-4 WW/RM/JFW
ACCESSION NR: AP3002301 S/0062/63/000/006/1143/1143

AUTHOR: Emanuel', N. M.; Kruglyakova, K. Ye.; Vichutinskiy, A. A.; Vasil'yev, 71
R. F.

TITLE: Chemiluminescence of solutions of desoxyribonucleic acid (DRNA) after
irradiation with x-rays 71

SOURCE: AN SSSR. Izv. Otdeleniye khimicheskikh nauk, no. 6, 1963, 1143

TOPIC TAGS: chemiluminescence, desoxyribonucleic acid (DRNA), x-rays, irradiation,
peroxides, recombination of radicals

ABSTRACT: A low intensity chemiluminescence has been discovered following irradiation of DRNA solution. The intensity falls exponentially with time. It was shown chemically that the peroxides arising from irradiation of DRNA decompose according to the same law at approximately the same rate. The chemiluminescence may arise from recombination of radicals formed from peroxides produced in the irradiation.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 25 Feb 63
SUB CODE : 00
Card 1/1

DATE ACQ: 16 Jul 63
NO REF SOV: 004

ENCL: 00
OTHER: 000

VASIL'YEV, R.F.

Calculation of the steady-state concentrations of R and RO₂ radicals as a function of the concentration of O₂ in the reactions of oxidation of hydrocarbons. Izv. AN SSSR. Ser.khim. no.7:1191-1195 J1 '63. (MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR.
(Radicals (Chemistry)) (Hydrocarbons) (Oxidation)

VASIL'YEV, R.F.; KOZLOVA, Z.G.; CHUCHUKINA, L.G.; SHLYAPINTOKH, V.Ya.;
EMANUEL', N.M.

Change of the catalytic activity of nickel stearate in the process
of ethylbenzene oxidation. Izv.AN SSSR Otd.khim.nauk no.8:1337-
1341 Ag '60. (MIRA 15:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Catalysts, Nickel) (Benzene) (Oxidation)

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.

Chemiluminescent method of measuring the relations between elementary constants in liquid-phase oxidation of hydrocarbons.
Dokl.AN SSSR 145 no.6:1301-1304 Ag '62. (MIRA 15:8)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N.Kondrat'yevym.
(Hydrocarbons) (Oxidation) (luminescence)

VASIL'YEV, R.F.

Kinetics of chemiluminescence and the study of reactions involved
in the liquid phase oxidation of hydrocarbons. Dokl. AN SSSR 144
no. 1:143-146 My '62. (MIRA 15:5)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom
V.N. Kondrat'yevym.
(Hydrocarbons) (Oxidation) (Luminescence)

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.

Intensification of chemiluminescence by the addition of
luminescent substances. Zhur.fiz.khim. 36 no.8:1799-1800
Ag '62. (MIRA 15:8)

1. Akademiya nauk SSSR, institut khimicheskoy fiziki.
(Luminescence)

VASIL'YEV, R.F.

Effect of cooling on the dark current and sensitivity of
photomultipliers. Zav.lab. 28 no.4:466-467 '62. (MIRA 15:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Photoelectric multipliers)

5.5300

40045

S/076/62/036/008/006/011
B101/B144

AUTHORS: Vasil'yev, R. F., and Vichutinskiy, A. A.

TITLE: Intensification of chemiluminescence by luminescent admixtures

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 8, 1962, 1799 - 1800

TEXT: The intensification of chemiluminescence from benzene + $5.9 \cdot 10^{-2}$ moles/l α, α' -azo-bis-isobutyronitrile (I) at 70°C by admixture of 9,10-diphenyl anthracene (II) (10^{-5} moles/liter), anthraquinone (III) ($2 \cdot 10^{-3}$ moles/liter), chlorophyll, or ethyl benzene (0.4 moles/liter) was investigated. Results: (1) With exclusion of air, the weak chemiluminescence of O_2 -saturated I ceases after about 280 sec owing to complete consumption of the O_2 . (2) Admixture of II increases the intensity of chemiluminescence from I by 15-20 times, admixture of III threefold. Extinction again occurs after about 280 sec. The same was observed when chlorophyll was admixed. The effect is explained by transfer of energy from the reaction products to the admixture molecules. The more likely this energy transfer, the stronger the increase of chemiluminescence

Card 1/2

Intensification of chemiluminescence... S/076/62/036/008/006/011
B101/B144

intensity. (3) Ethyl benzene intensifies chemiluminescence so that extinction occurs after about 170 sec. Oxidation is accelerated, and molecules of a different type are recombined: $RO_2 + R_1H \rightarrow RO_2H + R_1$; $R_1 + O_2 \rightarrow R_1O_2$. This sensibilization of chemiluminescence by admixing substances of good luminescence permits studies to be made at lower temperatures and concentrations, thus extending the use of the methods suggested (Dokl. AN SSSR, 142, 615, 1962; ibid., 144, 1962) for investigating the kinetics of oxidation in the liquid phase. There is 1 figure.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: December 23, 1961

Card 2/2

BOLDIN, A.A.; VASIL'YEV, R.F.

Use of alkali halide salts as solid "solvents" in infrared spectroscopy. Izv. AN SSSR. Ser. fiz. 27 no.7:981-985 '63. (MIRA 16:8)

1. Institut khimicheskoy fiziki AN SSSR.
(Alkali metal salts) (Spectrum, Infrared)

10291

S/020/62/145/006/015/015
B101/B144

5.3300
AUTHORS:

Vasil'yev, R. F., and Vichutinskiy, A. A.

TITLE:

Application of chemiluminescence to measure the ratios of elementary reaction constants of hydrocarbon oxidation in liquid phase

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 6, 1962, 1301-1304

TEXT: A former paper (DAN, 142, no. 2, 15 (1962)) showed that the chemiluminescence during initiated oxidation of hydrocarbons drops rapidly as soon as the oxygen reserves in the vessel are consumed. This effect is suggested for the measurement of w_{O_2} and $[O_2]_0$. The following reactions

are indicated: chain initiation: rate w_i (1); chain propagation:
 $R + O_2 \xrightarrow{k_2} RO_2$ (2); $RO_2 + RH \xrightarrow{k_3} ROOH + R'$ (3); chain termination: $R + R \xrightarrow{k_4}$
 termination products (TP) (4); $R + RO_2 \xrightarrow{k_5} TP$ (5); $RO_2 + RO_2 \xrightarrow{k_6} TP + O_2$ (6).

If (4) and (5) are negligible, $t_{dr} = [O_2]_0 / w_{O_2}$ holds for the moment t_{dr}

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S/020/62/145/006/015/015
B101/B144

Application of chemiluminescence...

of the luminescence drop. From G. Russell's equation for w_{O_2} (J. Am. Chem.

Soc., 79, 3871 (1957)) the following function is derived:

$1/t_{dr} = (k_3/\sqrt{k_6})(w_i/[O_2]_0)[RH] + w_i/2[O_2]_0$ (9). This equation gave values for the O_2 content three times as high as those obtained

experimentally during the oxidation of ethyl benzene or cumene initiated by α, α' -azo-bis-isobutyro nitrile, and values for the k_3/k_6 ratio

correspondingly only 1/3 as high. The last term of the right-hand side of Eq. (9) is corrected into $3w_i/2[O_2]_0$ allowing for the reactions of the

primary radical r_o of the initiator: $w_i \rightarrow r_o$; $r_o + O_2 \rightarrow r_o O_2$;

$r_o O_2 + RH \rightarrow r_o OOH + R$. The values obtained from this equation are

consistent with F. Russell's and other data published for $k_3/\sqrt{k_6}$ and $[O_2]_0$.

$[O_2]_0 = w_i t_{dr}$ holds for $[RH] = 0$. $k_3/\sqrt{k_6}$ for n-heptane and n-decane was so small that the experimental values in the diagram $1/t_{dr}$ versus $[RH]$ were

on a straight line parallel to the abscissa. The determination of the

Card 2/3

Application of chemiluminescence...

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B101/B144

oxidation rate by measurement of t_{dr} is suitable for those cases where it is difficult to measure P_{O_2} (viscous solvents, gas formation, high vapor pressure of reagents). At low temperatures and concentrations, this method is also applicable if the luminescence is intensified by activators. As the oxidation slows down toward the end of the reaction, the values obtained by means of chemiluminescence are too low by 0.5 - 1.5%. There are 2 figures and 2 tables.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: February 28, 1962, by V. N. Kondrat'yev, Academician

SUBMITTED: February 21, 1962

Card 3/3

VASIL'YEV, R.F.; VICHUTINSKIY, A.A.

Nature of the relationship between chemiluminescence and oxidation
by molecular oxygen. Dokl. AN SSSR 142 no.3:615-618 Ja '62.
(MIRA 15:1)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom
V.N.Kondrat'yevym.

(Luminescence) (Oxygen)

S/020/62/144/001/020/024
B124/B101

AUTHOR: Vasil'nev, R. F.

TITLE: Kinetics of chemiluminescence and study of liquid-phase oxidation reactions of hydrocarbons.

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 1, 1962, 143-146

TEXT: The kinetics of the weakening of chemiluminescence with time was studied in the course of oxidation by dissolved oxygen of ethyl benzene in the absence of inhibitors, of ethyl benzene in chlorobenzene solution in the presence of inhibitors: ionol (= 2,6-di-tert-butyl-4-methyl phenol) or o-cyclopentenyl-p-cresol, and of ethyl benzene in benzene solution in the presence of ionol, all at 60°C. Common features of all kinetic curves were a pronounced time variation in luminescent intensity and an abrupt transition from one steady state to another, with a constant concentration of radicals corresponding to each state at a constant initiation rate w_i .

The relation $-\frac{d[A]}{dt} = \frac{k_a}{k_b} \cdot \sqrt{w_i} \phi[A]$ or $-\frac{d[A]}{\left(\frac{k_a}{k_b} \sqrt{w_i} t\right)} = \phi[A]$ (2) was derived

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Kinetics of chemiluminescence and study ... S/020/62/144/001/020/024
B124/B101

for the transition from one state to another, where $\frac{d[A]}{dt}$ is the rate of consumption of the component A; k_a and k_b are the rate constants of the elementary acts under consideration, $R^\cdot + A_1 \xrightarrow{k_a} R^{\cdot\cdot} + (A')$ and $R^\cdot + R^\cdot \xrightarrow{k_b} \text{inactive products}$, respectively; the concentration of R^\cdot radicals during transition is $[R^\cdot] = \{w_1/k_b\}$. From this it is evident that, under the approximation made here, the shape of the kinetic curves for the consumption of A will remain unaltered, irrespective of the initiation rates, provided the reaction mechanism is the same. It was shown that, in the absence of oxygen, the inhibitor is not used up, i. e., ionol reacts only with peroxide radicals. An electronic computer was used to calculate the curves for the drop of chemiluminescence intensity due to oxygen consumption. The ratio k_2/k_4 , the former being characteristic of chain formation (appearance of R^\cdot radicals) at a rate of w_1 , and the latter of chain termination $R^\cdot + R^\cdot \rightarrow \text{inactive products}$, was determined from theoretical and experimental data and found to be constant with an error of $\pm 30\%$, although the ethyl benzene concentration and the initiation

Card 2/3

S/020/62/144/001/020/024
Kinetics of chemiluminescence and study...B124/B101

rate was varied by a factor of 12 - 15. Its average was found to be $2.7 \cdot 10^{-4}$ liters $^{-1/2}$ mole $^{-1/2}$ sec $^{-1/2}$. Thus, data on the elementary constant ratios, relative activity of inhibitors, and on their mechanisms of action can quickly be obtained provided the initiation rate or the solubility of oxygen in the system concerned are known. The range of application of the method can be further extended by "sensitization", i. e., by adding highly luminescent substances. There are 3 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: December 20, 1961, by V. N. Kondrat'yev, Academician

SUBMITTED: December 19, 1961

Card 3/3

S/032/62/028/004/010/026
B101/B138

9.9175 (119,1163,1192)

AUTHOR: Vasil'yev, R. F.

TITLE: Effect of cooling on dark current and sensitivity of photomultipliers

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 4, 1962, 466-467

TEXT: The photomultipliers 4)Y-29 (FEU-29, antimony-cesium cathode), 4)Y-28 (FEU-28, oxygen-silver-cesium cathode), and 4)Y-63M-2 (FEU-VBI-2, bismuth cathode) were tested at +20, -78, and -195°C. Cooling reduced the dark current by 1 - 3 orders of magnitude (10^{-9} - 10^{-12} a), resulting in improved signal-to-background ratio and reduced dark current fluctuation. The sensitivity of FEU-28 and FEU-VBI-2 photomultipliers was unaffected. With FEU-29, the sensitivity of different specimens increased or decreased at -78°C, but at -195°C it was zero for all specimens. By appropriate cooling the sensitivity of a photomultiplier can be increased to 20 - 50 photons/sec in the maximum sensitivity range at a time constant of 0.05 cps.

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Effect of cooling on dark ...

S/032/62/028/004/010/026
B101/B138

There are 1 table and 2 Soviet references.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of
Chemical Physics of the Academy of Sciences USSR)

Card 2/2

BOLDIN, A.A.; VASIL'YEV, R.F.

Method of compressed samples in infrared spectroscopy.
Zav.lab. 27 no.7:819-822 '61. (MIRA 14:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Spectrum, Infrared)

VASIL'YEV, R.F.; SHLYAPINTOKH, V.Ya.; EMANUEL', N.M.

Mechanism of the initiating action of nitrogen dioxide in the
oxidation of 2,7-dimethyloctane by molecular oxygen. Izv. AN
SSSR. Otd. khim. nauk no.2:218-225 F '61. (MIRA 14:2)

1. Institut khimicheskoy fiziki AN SSSR.
(Octane) (Nitrogen oxide)

5(4)

AUTHORS:

Vasil'yev, R. F., Karpukhin, O. N.,
Shlyapintokh, V. Ya.

SGV/20-125-1-26/67

TITLE:

Chemiluminescence in Reactions of Thermal Decomposition
(Khemilyuminesentsiya v reaktsiyakh termicheskogo raspada)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 1, pp 106-109
(USSR)

ABSTRACT:

The present paper describes the results obtained from experiments, in which a very weak luminescence was detected. The luminescence in question occurs with the decomposition of some organic compounds in hydrocarbons as solvents. A figure illustrates the scheme of the apparatus used for recording the luminescence. The reaction takes place in a cuvette placed in a transparent chamber. The cuvette is enclosed by a water-heated outer glass wall which acts as a thermostat. The image of the cuvette is then projected onto the photocathode of the photomultiplier FEU-19, and the current supplied by the latter is recorded by an electronic potentiometer EPPV-51. The authors investigated the thermal decomposition of the hydrogen peroxides of Tetralin; 2,7-dimethyloctane; isopropylbenzene; benzoyl peroxide and isoazobutyronitryl. Chlorobenzene was used as a

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SOV/20-125-1-28/67

Chemiluminescence in Reactions of Thermal Decomposition

solvent in all reactions. A table specifies the conditions under which the reaction was investigated. According to the experimental results the intensity of luminescence increases with rising temperature. In the case of the hydrogen peroxides of 2,7-dimethyl octane and of tetralin as well as of benzoyl peroxide the law $I \sim \exp(-A/RT)$ holds with good accuracy for the intensity of luminescence. For these substances the temperature coefficients amount to 29.3 ± 1.0 ; 26.5 ± 1.5 ; 31.9 ± 1.0 . At a given temperature, intensity remains unvaried for many hours; however, there is a limit temperature for each substance, beyond which intensity decreases according to an exponential law. The existence of a chemiluminescence signifies that the reaction zone contains excited particles. In all of the chemical systems investigated by the authors, only recombination reactions of radicals bring about an excitation. The following dependence on time and temperature applies for the intensity of luminescence: $I \sim e^{-E/RT} e^{-kt}$. Most of the reactions investigated here agreed well with this law. The temperature coefficients A determined by the authors are in agreement with the activation energies of the

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Chemiluminescence in Reactions of Thermal
Decomposition

SOV/20-125-1-28/67

decomposition of the corresponding substances. Chemiluminescence reactions may widely occur even in simple reactions. The authors probably observed the luminescence of primary excited particles. There are 3 figures, 1 table, and 6 references, 2 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: October 29, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: September 20, 1958.

Card 3/3

VASIL'YEV, R.F.; KARPUKHIN, O.N.; SHLYAPINTOKH, V.Ya.; EMANUEL', N.M.

Ozone initiation of isodecane oxidation and the chemiluminescence
connected with it. Dokl. AN SSSR 124 no.6:1258-1260 ? '59.
(MIRA 12:3)

1.Chlen-korrespondent AN SSSR (for Emanuel'). 2.Institut
fizicheskoy khimii AN SSSR.
(Oxidation) (Ozone) (Isodecane)

VASIL'YEV, R.F.; KARPUKHIN, O.N.; SHLYAPINTOKH, V.Ya.

Chemiluminescence in thermal decomposition reactions. Dokl.
AN SSSR 125 no.1:106-109 Mr-Apr '59. (MIRA 12:4)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno
akademikom V.N.Kondrat'yevym.
(Luminescence)

5(4)
 AUTHORS: Vasil'yev, R. F., Karpukhin, O. N., SOV/20-124-6-21/55
 Shiyapintokh, V. Ya., Emanuel, N. M., Corresponding Member,
 AS USSR

TITLE: Gas Initiation by Ozone in the Reaction of the Oxidation of
 Isodecane and the Chemiluminescence Connected With It
 (Gazovoye inititsirovaniye ozonom v reaktsii okisleniya izo-
 dekana i svyazannaya s nim khemilyuminesentsiya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 6, pp 1258-1260
 (USSR)

ABSTRACT: The present paper deals with the stage of initiation by ozone
 in segregated form, i.e. the authors investigate such phenom-
 ena and processes as occur during the short action of the
 initiator. Isodecane (2,7-dimethyl-octane) was used as test
 object. Preliminary tests showed that if ozone is blown past
 during a short time the reaction is accelerated considerably.
 The authors recorded a weak glow which was produced during
 the bubbling of oxygen (containing 2-3 % ozone) by isodecane.
 This isodecane was in a glass oxidation cell at temperatures
 of 20-90°. By glow the photomultiplier FEU-19 served as an
 indicator of the glow. The photoelectric current was recorded

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Gas Initiation by Ozone in the Reaction of the
Oxidation of Isodecane and the Chemiluminescence Connected With It

SOV/20-124-6-21/55

by means of the electronic potentiometer EPPV-51. The first diagram shows the intensity of glow as a function of time during the uninterrupted blowing-through of ozone and isodecane at a temperature of 55° . Intensity increases gradually and, after 2.5 hours, it attains a maximum after which it gradually decreases. As soon as the adding of ozone is interrupted, the glow immediately vanishes in all stages of the reaction. If ozone is again supplied, the previous intensity is quickly restored. According to these results the glow is caused in the interaction between ozone and a compound, which was formed already before this interaction as the result of a reaction of ozone with carbon. The above mentioned intensity maximum indicates that the concentration of this hypothetical compound passes through a maximum. In this case the kinetics of the accumulation of this compound agrees with the kinetics of the accumulation of the intermediate product in the case of successive chemical reaction. An other possibility of explaining the phenomena discussed is rejected on the grounds of being unsuited. A further proof of the intermediate character of the product of primary interaction

Card 2/3

Gas Initiation by Ozone in the Reaction of the SOV/20-124-6-21/55
Oxidation of Isodecane and the Chemiluminescence Connected With It

with ozone was supplied by experiments carried out with higher temperatures. Thus, the interaction between ozone and normal hydrocarbons at moderate temperatures is a complicated process in the course of which a relatively stable intermediate compound is formed. There are 3 figures and 4 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: October 29, 1958

Card 3/3

86408

5.1190

2209, 1208, 1274

S/062/60/000/008/015/033/XX
B013/B055

AUTHORS: Vasil'yev, R. F., Kozlova, Z. G., Chuchukina, L. G.,
Shlyapintokh, V. Ya., and Emanuel', N. M.

TITLE: On the Change in Catalytic Activity of Nickel Stearate
During the Oxidation of Ethyl Benzene

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1960, No. 8, pp. 1337-1341

TEXT: The present publication treats a phenomenon observed during the nickel-distearate catalyzed oxidation of various hydrocarbons. The authors observed that in these reactions the maximum concentration of the hydroperoxide fairly equals its concentration in an uncatalyzed reaction. It was shown that the anomalous course of the kinetic curve of the hydroperoxide during the oxidation of ethyl benzene is connected with an inactivation of the catalyst. Various experiments were made to establish the cause of the reduced activity of the catalyst during the oxidation process (Figs. 3, 4). These experiments lead the authors to assume that products reacting with the catalyst and reducing its activity are formed during
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86408

On the Change in Catalytic Activity of Nickel S/062/60/000/008/015/033/XX
Stearate During the Oxidation of Ethyl Benzene B013/B055

the reaction. Since acids accumulate during the oxidation of the decomposition products of hydroperoxide, it seems likely that these very acids inactivate the catalyst, e.g. by forming insoluble salts (Refs. 2-4). Experiments performed in this direction showed that the reduced activity of the catalyst is indeed related to its reaction with these acids (Fig. 5). The established reduction of catalyst activity during the reaction permits a simple explanation for the accumulation of peroxides during the nickel-stearate catalyzed reaction (Figs. 1, 2). Till the maximum peroxide concentration is reached, the nickel salt is completely inactivated. The reaction is then practically uncatalyzed and the maximum peroxide concentrations are therefore in agreement. At the same time the maximum concentration is reached more quickly in the presence of nickel stearate since the latter has a strong catalytic effect at the outset of the reaction. The results of this investigation furnish further proof that in the catalytic oxidation of hydrocarbons metal salts are no catalysts but rather initiators of the process. Their activity, and frequently also the mechanism of their effect, change during the process. The observed reaction kinetics therefore reflect not only the properties of the reacting system, but also the changes in the activity and action of the catalyst in the

Card 2/3

On the Change in Catalytic Activity of Nickel Stearate During the Oxidation of Ethyl Benzene

86408/60/000/008/015/033/XX
B013/B055

individual stages of the reaction. In studies of the catalytic mechanism, stabilization of the catalyst is particularly important. This would considerably facilitate the explanation of the mechanism of the catalytic effect of metal salts. There are 6 figures and 4 references: 3 Soviet and 1 British.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics of the Academy of Sciences
USSR)

SUBMITTED: February 18, 1959

Card 3/3

VASIL'YEV, R.I.; YAKOVLEVA, A.V.

Spectrum of tungsten in the vacuum ultraviolet region. Opt.
1 spektr. 5 no.5:620-621 N '58. (MIRA 11:12)
(Tungsten--Spectra)

SOV/51-5-5-20/23

AUTHORS: Vasil'yev, R.I. and Yakovleva, A.V.

TITLE: The Spectrum of Tungsten in the Vacuum Ultraviolet Region (Spektr vol'frama v vakuumnoy ul'trafiioletovoy oblasti)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 5, pp 620-621 (USSR)

ABSTRACT: The tungsten spectrum was recorded in the region 250-1500 Å using an oblique incidence spectrograph (79°) with a glass diffraction grating of 1 m radius of curvature and 591 lines/mm. The spectrum was recorded on cine film of 35 m length, stretched along Rowland's circle. A spark produced in vacuum between tungsten rods was used as a source of light. A capacitor battery of 0.3 μF charged to 50 kV was used to produce the spark. The best conditions for recording the spectrum were obtained with 20-40 sparks per minute. The film was exposed for ten or more hours. The authors observed, in addition to tungsten lines, carbon, oxygen and nitrogen lines which were used as wavelength standards. The wavelengths were measured within 0.3-0.4 Å. The spectrograms obtained contained a large number of lines. Since the spark is a decaying discharge, its spectrum contains lines corresponding to various stages of ionization of the tungsten atom. Table 1 gives ionization energies of tungsten and the corresponding wavelengths of the short-wavelength

Card 1/2

SOV/51-5-5-20/23

The Spectrum of Tungsten in the Vacuum Ultraviolet Region

edges. In the 1450-1500 Å region the results obtained by the present authors were compared with those of E. and L. Bloch (Ref 1). It was found that the Blochs obtained a larger number of lines using a spark working in atmospheric air, than the number obtained using a vacuum spark. Table 2 gives the wavelengths and intensities of the most intense and sharpest lines of tungsten. Their intensities were estimated visually. There are 2 tables and 3 references 1 of which is Soviet, 1 French and 1 translation.

SUBMITTED: May 9, 1958

Card 2/2

1. Tungsten--Spectrum 2. Tungsten--Testing equipment 3. Electric discharges--Performance 4. Ultraviolet spectroscopy

VASIL'YEV, R.Kh. (Kaliningradskaya oblast', gor. Chernyakhovsk,
ul. Lenina, d.81)

Salivary gland located in the supraclavicular region. Vest.
khir. 89 no.11:137 N '62. (MIRA 16:2)

1. Iz khirurgicheskogo otdeleniya (zav. - R.Kh. Vasil'yev)
Chernyakhovskoy gorodskoy bol'nitsy (glavnyy vrach - V.D.
Kikosh).

(SALIVARY GLAND—ABNORMITIES AND DEFORMITIES)

VASIL'YEV, R. I. and GLEBOVA, M. T.

"An electronic micrometer," Zavodskaya laboratoriya, Vol. 12, Nls 9/10. p. 82, 1946.

ATLASOV, I.P.; DEMOKIDOV, K.K.; DIBNER, V.D.; EGIAZAROV, B.Kh.; IVANOVA,
A.M.; LOBANOV, M.P.; MARKOV, F.G.; RABKIN, M.I.; RAVICH, M.G.;
SAKS, V.N.; SOKOLOV, V.H.; TKACHENKO, B.V.; USTRITSKIY, V.I.;
NALIVKIN, D.V., nauchnyy red.; VASIL'YEV, R.P., red.; SOLOV'YEV,
L.D., red.; NEKHOROSHEV, A.P., red.; DOLGONOS, L.G., tekhn. red.

[Geological map of the Soviet Arctic] Geologicheskaya karta
Sovetskoi Arktiki. Sost. I.P. Atlasov [i dr.] Glav. red. F.G.
Markov. Nauchn. red. D.V. Nalivkin. [Moskva] 1957. .. Col.
map 89 x 131 cm. no. 4 sheets 51 x 72 cm. .. Scale 1:2,500,000.
.. Inset: [Geological map of Wrangel Island] Geologicheskaya karta
Ostrova Vrangeliya, 1:1,500,000. (MIRA 11:8)
(Arctic regions--Geology--Maps)
(Wrangel Island--Geology--Maps)

03049

9,4230

S/141/59/002/05/010/026

AUTHORS: Antakov, I.I. and Vasil'yev, R.P. ^{E310/E382}

TITLE: Experimental Investigation of the Travelling-wave Amplifier Having a Trochoidal Electron Beam with the "Bleeding" of the Accelerated Electrons 2) 2)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 5, pp 741 - 747 (USSR)

ABSTRACT: Experimental results are reported on travelling-wave tube research performed at the Scientific Research Institute of Radio Physics of Gor'kiy University. A trochotron-type travelling-wave amplifier, designed for medium- and high-power amplification in the 3-cm range was studied. The research was devoted mainly to verification of A.V.Gaponov's theory of travelling-wave tubes having trochoidal electron beams. In the experimental tubes, according to theoretical requirements, a provision was made for removal of "wrong-phased" (accelerated) electrons from the interaction space of the tube. A schematic diagram of the trochotron amplifier tube used in the studies is shown in Figure 1. Electrode 3 (shaping section) was introduced here for study of the optimum selection condition of "wrong-phased"

Card1/3

68649

S/141/59/002/05/010/026

E310/E382

Experimental Investigation of the Travelling-wave Amplifier Having
a Trochoidal Electron Beam with the "Bleeding" of the Accelerated
Electrons

electrons without altering the beam parameters. Variation of operating conditions was achieved by varying the potential of plate 3 in relation to the cathode. A wave delay was introduced into the system by giving the electrode a comb-like shape. This improved the large-current operation of the tube and increased the stability of the amplifier against self-excitation. Conditions favourable for obtaining maximum output power were investigated. It was found in this regard that the trochoidal electron trajectories are most effectively shaped when the applied magnetic field gradually increases from the cathode and an optimum positive potential is applied to the cathode element. Under such conditions at 5 500 V plate voltage, the maximum output power was of the order of 35 W, as shown in Figure 2. The trochotron amplifier can be tuned by a magnetic field within a 100-150 Mc frequency band.

Card 2/3

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S/141/59/002/05/010/026

E310/E382

Experimental Investigation of the Travelling-wave Amplifier Having
a Trochoidal Electron Beam with the "Bleeding" of the Accelerated
Electrons

There are 7 figures and 4 references, 2 of which are
Swiss and 2 Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut
pri Gor'kovskom universitete (Scientific Research
Institute of Radio Physics of Gor'kiy University)

SUBMITTED: July 6, 1959

Card 3/3

21176

S/141/60/003/006/015/025
E192/E362

9.13.00 (4150 1130)

AUTHORS: Antakov, I.I., Bokov, V.M., Vasil'yev, R.P. and Gaponov, A.V.

TITLE: Interaction Between a Trochoidal Electron Beam and Electromagnetic Waves in a Rectangular Waveguide

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 6, pp. 1033-1044

TEXT: A detailed analysis of the interaction between a trochoidal electron beam and electromagnetic waves in a rectangular waveguide with three ideally conducting walls and "one" impedance wall is presented. A sufficiently weak electron beam interacts effectively with one of the normal waves in a transmission line or waveguide only under the condition that $h_0(1 + \epsilon) = h_e + mh_H$ or:

$$\omega = \frac{m\omega_H}{(1 + \epsilon)v_{||}/v_{\phi} - 1} \quad (1)$$

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21176

S/141/60/003/006/015/025
E192/E382

Interaction Between

where $m = 0, \pm 1, \pm 2, \dots$ $|\varepsilon| \ll 1$ and $h_0 = \omega/v_{\parallel}^{(0)}$ is the propagation constant of the corresponding normal wave in a "cold" waveguide; $v_{\parallel} = E_0/B_0$ is the drift velocity of the electrons moving along a trochoid and having an oscillation amplitude a in crossed fields E_0 and B_0 ;

$h_e = \omega/v_{\parallel}$, $h_H = \omega_H/v_{\parallel}$, $\omega_H = (e/m)B_0 = \eta B_0$ which is the gyromagnetic frequency. If the condition of synchronism given by Eq. (1) is fulfilled, the scattering equation for the correction of the order $\delta = (h - h_0)/h_0$ for the propagation constant of the electromagnetic wave in the waveguide for comparatively weak signals (without taking into account the space charge) is in the form (Refs. 2, 5):

$$E_y = h_n \cos(x_n x) \operatorname{ch}(\gamma y); H_x = -\frac{k^2 - x_n^2}{kZ_0} \cos(x_n x) \operatorname{ch}(\gamma y); \quad (3) \quad (3)$$

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$$H_z = -i \frac{h_n x_n}{kZ_0} \sin(x_n x) \operatorname{ch}(\gamma y).$$

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E192/E382

Interaction Between

where I_o is the beam current,

$U_o = v_{||}^2 / 2\eta$ is the voltage corresponding to the drift velocity,

$\beta_{\perp} = v_{\perp} / c$ (where c is the velocity of light, v_{\perp} is the transverse electron velocity),

G_{xp} , G_{yp} , G_{zp} are the Fourier coefficients of the high-frequency Lorenz force acting on an electron moving along a stationary trajectory in the field of a non-perturbed normal wave,

N is the normalising coefficient of this wave.

Eq. (2) is used to analyse the interaction between the H-wave in a smooth-walled rectangular wave with the

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electron beam and its interaction with a non-symmetrical wave in a comb-type (periodic) waveguide. The interaction between the electron beam and a symmetrical wave in a comb-type strip waveguide is also investigated; the following special cases in

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Interaction Between

the above type of interaction are considered: a magnetron amplifier with a trochoidal beam; interaction with a fast electromagnetic wave and interaction with a slow electromagnetic wave. The problem was also investigated experimentally on two specially constructed models, provided with comb-type delay systems. Such a system is illustrated in Fig. 4; this consists of: 1 - a comb-type anode; 2 - cathode; 3 - focusing electrode; 4 - electron beam and 5 - a cathode plate. Both models were designed for the 3-cm operating range. The results of the experiments are in good agreement with the calculated data and indicate that for the electrons rotating in a constant magnetic field both mechanisms of interaction of the type "O", i.e. the self-phasing and the spatial debunching, are equally effective and can be employed in microwave amplifiers and oscillators. There are 6 figures and 11 references: 10 Soviet and 1 non-Soviet.

Card 4/6

Interaction Between

S/141/60/003/006/015/025
E192/E382

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy
institut pri Gor'kovskom universitete
(Scientific Research Radiophysics Institute
of Gor'kiy University)

SUBMITTED: July 13, 1960

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Interaction Between

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E192/E382

Fig. 4:

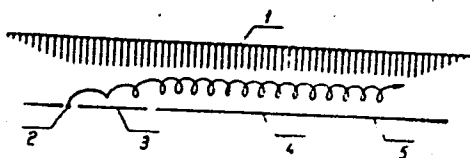


Рис. 4. Модель усилителя с гребенчатой линией замедления:

1 — гребенчатый анод, 2 — катод, 3 — фокусирующий электрод;
4 — электронный луч, 5 — катодная пластина;

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S/103/63/024/001/007/012
D201/D308

AUTHORS: Vasil'yev, R. R. and Shastova, G. A. (Moscow)

TITLE: Statistical coding in telemechanics

PERIODICAL: Avtomatika i telemekhanika, v. 24, no. 1, 1963, 82-91

TEXT: The authors give a short theoretical analysis of the interference-killing properties of the address transmission of an information system (also called coded selection transmission), in which the number of address is assigned to every object with two possible states. The signal of the control command 'connect' or 'disconnect' is transmitted, after addressing, by means of any existing method. In comparison with a multichannel system, a coded selection transmission may be used for statistical coding in systems controlling several objects. The speed of operation is the same, and the efficiency and the interference-killing properties are much better. For a given delay probability and statistics of information, the maximum number of objects which can be serviced may be determined by a single system of address transmission. If

Card 1/2

Statistical coding in ...

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the dependence of losses due to delays is known, an optimum classification of controlled objects into address transmission groups is possible. There are 3 figures and 3 tables. ✓B

SUBMITTED: April 15, 1962

Card 2/2

AUTHOR: VASIL'YEV R.R. PA - 2569
 TITLE: Concerning static methods of phototelegram transmission.
 (O statisticheskikh metodakh peredachi fototelegramm.- Russian)
 PERIODICAL: Radiotekhnika i Elektronika 1957, Vol 2, Nr 2, pp 136 - 143
 (U.S.S.R.)
 Received: 4/1957 Reviewed: 6/1957
 ABSTRACT: This is an abbreviated text of a lecture delivered at the
 conference held in 1955 on the theory of Informations.
 Such methods are described as static as serve the purpose of
 increasing the reproduction velocity, at the expense of the
 application of different static dependences of the originals
 to be transmitted.
 It is of advantage to reduce all degrees of optical density
 to two - the white and the black - by means of contrasting
 devices. To shorten the time of transmitting phototelegrams
 it is necessary first to determine the entropy H of the
 phototelegram and the capacity C of the connecting channel
 (maximum velocity of the transmission of information on this
 channel). The maximum gain in comparison to the ordinary
 method is equal to C/H . The equation for the entropy of a
 scanning element is set up. It is shown that an ideal code in
 the case of a suitable selection of N scanning elements
 attains a 2- to 3-fold velocity gain.

CARD 1/2

PA - 2569

Concerning static methods of phototelegram transmission.

The practical realization of such a coding is carried out by means of a system with a return motion of the ray. The ratio signal/disturbance at the lines existing for phototelegraphic connection is of the order of magnitude 100. A high velocity can be obtained by the application of the system of transmission of information by using a permanent impulse. There follows a description of the system dealing with the picture at double the velocity, which was worked out at the Institute for Automation and Telemechanics and which partly realizes the possibilities mentioned above. Investigations of the methods described show that it is possible theoretically to improve transmission velocity by about the 10- to 15- fold. Very great difficulties are, however, caused by distortions of the signals and the production of complicated coding- and decoding devices.
(6 ill... and 2 citations from Slav Publications.)

ASSOCIATION: not given.
PRESENTED BY: -
SUBMITTED: 3.3. 1956
AVAILABLE: Library of Congress.

CARD 2/2

VASIL'YEV, R.R.

AUTHOR: BAKHMET'YEV, M.M., VASIL'YEV, R.R. PA - 2838
TITLE: Information Criteria for the Estimation of Telemetering Systems.
(Informatsionnyye kriterii otsenki teleizmeritel'nykh sistem,
Russian)
PERIODICAL: Avtomatika i Telemekhanika, 1957, Vol 18, Nr 4, pp 371 - 375
(U.S.S.R.)
Received: 5 / 1957 Reviewed: 6 / 1957
ABSTRACT: One of the most important criteria for the quality of Telemetering Systems (TMS) is the number of information units which is transmitted per unit of the entire frequency band. The number of informations at the output of the system can be computed if a number of parameters characterizing the TMS is known. Among them are: the frequency band of the signal, the average efficiency of the signal, interferences, etc. All TMS can be divided into two large groups: Systems with discrete and such with continuous effect. In both cases the number of informations at the output is a finite quantity. An accurate computation of this quantity may in some cases be complicated, but in the case of some assumptions computation of the velocity of the formation of information at the output of the TMS is not difficult. Examples for the determination of criteria for the evaluation of TMS operation are given. The formulae derived here may be used for the purpose of judging the TMS, without having to take the restriction which is due to the usual character of error distribution into account.

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PA - 2838

Information Criteria for the Estimation of Telemetering Systems.

The results obtained in this manner will be approximations. A table contains the evaluation of informations of the three telemetering systems in the U.S.S.R.: that of the firm of Brown Boveri, the English system, and that of the Institute for Automation and Telemechanics of the Academy of Science of the U.S.S.R. In an appendix the optimum distribution of the parameters in the case of a limitation of the amount of the mean square of the parameter and its maximum amount is determined. (1 table and 2 citations from Slav publications)

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress.

Card 2/2

VASIL'YEV, R.R.

VASIL'YEV, R.R.; PETROVSKIY, A.M.

"Turtle" without shell. Znan.sila 32 no.2:32 F '57. (MLBA 10:5)
(Machinery, Automatic)

VASIL'YEV, R. R.

"Turtle Models" (14 December 1956).

Paper presented at the Seminars on Cybernetics at Moscow University during the 1956-57 school year.

Problemy Kibernetiki, No. 1, 1958

AUTHOR: Vasil'yan, R. R., (Moscow) 807/103-19-11-8/10

TITLE: Efficiency of the Frequency Band in Telemetry (Effektivnost' ispol'zovaniya polosy chastot pri teleizmerenii)

PERIODICAL: Avtomatika i telemekhanika, 1958, Vol 19, Nr 11, pp 1066 - 1069 (USSR)

ABSTRACT: The author shows a method of determining the efficiency of the frequency band of telemetry channels for various types of modulation. The method is based on the application of information criteria for evaluations of telemetry systems. Only single channel telemetry systems with different types of signal modulation are investigated. The method is also applicable to multi-channel systems. The systems are evaluated by their efficiency when the frequency band of transmission channels is used. The spectrum of the quantity measured is limited by the frequency band $O-F_m$. The individual values can be transmitted in time intervals $T = \frac{1}{F_m}$; Δf = frequency band of the transmission channel in $\gamma = \Delta f / 2F_m$ - a generalized parameter.

Card 1/2

Efficiency of the Frequency Band in Telemetering

SOV/63-12-11-8/10

It is shown that the efficiency of frequency modulation, pulse frequency modulation, pulse-time modulation, and pulse-width modulation, is about equal when using the frequency band of the transmission channel, especially for ... figures, 1 table, and 2 Soviet references.

SUBMITTED: January 8, 1958

Card 2/2

AKSENOV, I.Ya.;BAZILEVSKIY, Yu.Ya.;VASIL'YEV, R.R.

Second International Congress on Cybernetics. Probl. kib. no.2:
311-319 '59 (MIRA 13:3)
(Cybernetics--Congresses)

2. A. Belyakov, Second International Congress on Cybernetics (3 March 1958) (contents of the paper were published in the second issue of Problemy kibernetiki in the technical section).

Discussion of I. A. Polesnyy's book Signal (17 October 1958).

3. E. Bryson and O. N. Kozhich, Investigation of the Physiological Mechanisms of a Complex Reflex in Mice Under Labyrinth Conditions (31 October 1958).

4. N. Petrovskiy, Report on the Mission to the US (18 November 1958).

5. A. Lurman and S. V. Malinitskiy, Problem of the Systematization of the Basic Concepts of Cybernetics (28 November 1958).

6. D. Aksentz, Conference on Automation in Railroad Transportation (12 December 1958).

7. A. Strydom, Means of Developing the Structure of Computers (26 December 1958).

8. P. Terzhov, Report on the Cybernetics Symposium in London (26 December 1958).

9. G. Gerasimov, Certain Problems of the Behavior of Living Organisms (13 February 1959).

10. B. Kozlovskiy, Cybernetic Problems in Economics (27 February 1959).

11. I. Volynskiy, The Basis of Technical Means of Weight and Speed of River Craft with the Aid of Electronic Digital Computers (13 March 1959).

12. V. Savitskiy, Electrical Simulation of Certain Self-Adaptive Systems (10 April 1959); a part will be published in Problemy kibernetiki, No. 1).

13. A. Lurman, O. N. Kozhich, and T. N. Molodtsov, Report on the Leningrad Conference on Mathematical Linguistics (28 April 1959, et., pp 273-278 of this book).

Report presented at the Moscow University Seminar on Cybernetics during 1958-59 school year. (under direction of A. A. Lyapunov)
(reported in Problemy kibernetiki, No. 3, 1960, p. 273)

PHASE I BOOK EXPLOITATION

SOV/5582

Vasil'yev, Rostislav Romanovich, and Galina Alekseyevna Shastova

Peredacha telemekhanicheskoy informatsii (Transmission of Telemechanical Information) Moscow, Gosenergoizdat, 1960. 143 p. Errata slip inserted. (Series: Biblioteka po avtomatike, vyp. 19) 15,000 copies printed.

Editorial Board: I.V. Antik, S. N. Veshenevskiy, V. S. Kulebakin, A. D. Smirnov, B. S. Sotskov, Ye. P. Stefani, and N. N. Shumilovskiy; Ed.: N.A. Kuznetsov; Tech. Ed.: K.P. Voronin.

PURPOSE: This booklet is intended for engineers in the field of telemechanics and for students of corresponding specialized courses.

COVERAGE: The book deals with the theoretical fundamentals of remote control data transmission over noisy channels. Certain problems of applying theory of information methods in telemechanics are discussed. Engineering methods of designing noiseproof features for transmission of discrete and continuous messages are given. The reader is assumed to have a knowledge of mathematics of the level of technical schools of higher education. Sections 1 and 2 of Ch. I, and Ch. II

Card 1/4

Transmission of Telemechanical Information

SOV/5582

were written by R. R. Vasil'yev and Chs. III and IV by G. A. Shastova. Sections 3 and 4 of Ch. I, on types and characteristics of noise, were written by L. B. Venchkovskiy. In addition to the bibliography listed at the end of the book, the author used works of the following staff members of the Institut avtomatiki i telemekhaniki Akademii nauk SSSR (Institute of Automation and Telemechanics of the Academy of Sciences USSR): V. A. Kashirin, N. V. Pozin, Yu. I. Chugin, and others. These works were published in the periodical "Avtomatika i telemekhanika" (Automation and Telemechanics). There are 12 references, all Soviet (including 5 translations).

TABLE OF CONTENTS:

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2. Telemechanical information and its processing for transmission	9
3. Types of noise	21
4. Static characteristics of noise and methods of their experimental investigation	27

Card 2/4

BOKSER, Oskar Yakovlevich; KLEVTSOV, Mikhail Ivanovich; VASIL'YEV,
R.R., red.

[Radioelectronic apparatus for the time analysis of reflexes]
Radioelektronnaya apparatura dlia vremennogo analiza reflektov.
Moskva, Izd-vo "Energia," 1964. 62 p. (Massovaya radiobiblioteka, no.512)
(MIRA 17:5)

VASIL'YEV, R.R. (Moskva); SHASTOVA, G.A. (Moskva)

Statistical coding in telemechanics. Avtom.i telem. 24 no.1:
82-91 Ja '63. (MIRA 16:1)
(Information theory) (Telecommunication)